

REMARKS

Claims 1-11 are amended. Claims 17-23 are added. After entry of this amendment, claims 1-23 will remain pending in the patent application.

Claims 2-10 have been amended to correct minor clerical mistakes.

The drawings were objected to. In response, Applicant has substituted FIG. 1 with a new figure that depicts a lithographic projection apparatus according to the invention. In this new figure, reference signs BP, PM, P1, P2, M1 and M2 have been deleted and reference signs Ex, AM, IN, and CO have been added. Applicant notes that, contrary to what is stated in the Office Action, reference sign IF is mentioned in the description in paragraph [0038]. It is respectfully submitted that the lithographic projection apparatus depicted in new FIG. 1 has been redrawn in accordance with the description of the projection apparatus included in the original disclosure. Therefore, Applicant respectfully submits that new FIG. 1 does not represent new matter. Therefore, reconsideration and withdrawal of the objection to FIG. 1 are respectfully requested.

Claims 1, 11-12, and 15-16 were rejected under 35 U.S.C. §102(e) over Klebanoff et al. (U.S. Pat. No. 6,533,952) (Klebanoff). The rejection is respectfully traversed.

Claim 1, as amended, is patentable over Klebanoff at least because it recites a lithographic projection apparatus combining a number of elements including, for example, a radiation source independent of the radiation system constructed and arranged to supply radiation capable of removing contaminant particles adhered to an optical component without substantially heating said optical component. Klebanoff does not teach or suggest a lithographic apparatus including at least this feature. Therefore, Klebanoff does not teach or suggest each and every feature recited by claim 1 and, as a result, cannot anticipate this claim.

In contrast to the lithographic projection apparatus recited by claim 1, Klebanoff discloses a process for preventing the formation of contamination on surfaces exposed to radiation. Klebanoff indicates that the projection beam is responsible for the contamination of optical elements. (See Col. 1, lines 47-52) More particularly, Klebanoff discloses that "subjecting [a] surface [210] to high energy radiation, such as [by] EUV radiation, can cause secondary electrons to eject from the surface [210]." (See col. 3, lines 57-59) Klebanoff further discloses that "these electrons can react with the adsorbed water molecules causing them to dissociate into reactive oxygen species that will, in turn, react with the Si surface." (See col. 3, lines 60-62). Therefore, in order to reduce this phenomenon, Klebanoff suggests

introducing into the system a small amount of hydrocarbon gas that will also bind to the surface. (See col. 2, lines 62-65) In this case, the hydrocarbon molecules will also be dissociated by the secondary electrons ejected from that surface. (See col. 4, lines 1-2) The dissociated fragments will then react with reactive oxygen species on the surface to form volatile products such as CO and CO₂. In this way, reactive oxygen species that could oxidize the surface and degrade its reflectivity are eliminated. (See col. 4, lines 3-7)

Klebanoff, however, makes no mention of a source of radiation independent of the radiation system constructed and arranged to supply radiation capable of removing contaminant particles adhered to an optical component without substantially heating said optical component.

With respect to claim 11, it is respectfully submitted that this claim is patentable over Klebanoff for at least the reasons provided above related to claim 1. Namely, claim 11, as amended, is patentable over Klebanoff at least because it recites a device manufacturing method combining a number of elements including, for example, removing contaminant particles, which are adhered to an optical component through which the beam of radiation passes, by irradiation with a radiation source independent of a source of the patterned beam, said radiation source providing a radiation capable of removing said contaminant particles without substantially heating said optical component. As mentioned previously, Klebanoff does not teach or suggest a method including at least this feature. Therefore, Klebanoff does not teach or suggest each and every feature recited by claim 11 and, as a result, cannot anticipate this claim.

Claims 12, 15, and 16 depend from claim 11 and are patentable for at least the same reasons given above related to claim 11 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1, 11-12, and 15-16 under 35 U.S.C. §102(e) over Klebanoff are respectfully requested.

Claims 2-10, and 13-14 were rejected under 35 U.S.C. §103(a) over Klebanoff in view of Tanaka (U.S. Patent No. 6,496,248). The rejection is respectfully traversed.

Claims 2-10 depend from claim 1 and are patentable over Klebanoff for at least the same reasons given above related to claim 1. Namely, claims 1-10 are patentable over Klebanoff at least because they recite a number of elements including, for example, a radiation source independent of the radiation system constructed and arranged to supply radiation capable of removing contaminant particles adhered to an optical component without substantially heating said optical component. Klebanoff does not teach or suggest a

lithographic apparatus including at least this feature. Therefore, Klebanoff does not teach or suggest each and every feature recited by claims 2-10 and, as a result, cannot anticipate these claims.

It is respectfully submitted that Tanaka fails to overcome this deficiency. Therefore, as none of the applied art discloses or suggests an apparatus including a radiation source independent of the radiation system constructed and arranged to supply radiation capable of removing contaminant particles adhered to an optical component without substantially heating said optical component, the combination of Klebanoff with Tanaka would not result in the invention of claims 2-10.

Similarly, claims 13 and 14 depend from claim 11 and are patentable over Klebanoff for at least the same reasons given above related to claim 11. Namely, claims 13 and 14 are patentable over Klebanoff because they recite a device manufacturing method combining a number of elements including, for example, removing contaminant particles, which are adhered to an optical component through which the beam of radiation passes, by irradiation with a radiation source independent of a source of the patterned beam, said radiation source providing a radiation capable of removing said contaminant particles without substantially heating said optical component. As mentioned previously, Klebanoff does not teach or suggest a method including at least this feature. Therefore, Klebanoff does not teach or suggest each and every feature recited by claims 13 and 14 and, as a result, cannot anticipate these claims.

It is respectfully submitted that Tanaka fails to overcome this deficiency. Therefore, as none of the applied art discloses or suggests a method including this feature, the combination of Klebanoff with Tanaka would not result in the invention of claims 13 and 14.

Furthermore, Applicant respectfully submits that neither of the references provides any motivation or suggestion to combine the teaching of the references, nor does the knowledge generally available to one of ordinary skill in the art. In addition, it is respectfully submitted that Klebanoff teaches away from the present invention since Klebanoff emphasizes that radiations impinging onto optical surfaces are responsible for the contamination of these surfaces. (See col. 1, lines 47-52, col. 3, lines 50-67 and col. 4, lines 1-7) As a result, Applicant respectfully submits that the use of radiations to clean a surface would not have been obvious in light of what Klebanoff discloses.

Accordingly, reconsideration and withdrawal of the rejection of claims 2-10, and 13-14, under 35 U.S.C. §103(a) over Klebanoff in view of Tanaka, are respectfully requested.


New claims 17-23 are directed to additional features of the original disclosure. Support for these claims may be found, for example, in paragraphs [0043], [0051]-[0054], [0059]. Applicant respectfully submits that these new claims are in condition for allowance.

Applicant has addressed all the Examiner's rejections and objections and respectfully submits that the application is in condition for allowance. A notice to the effect is earnestly solicited.

If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,
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Enclosure: Replacement Sheet - FIG. 1